

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3161907****Date:20-05-2024****Subject Name: Basics of Industrial Engineering****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- |   | <b>MARKS</b> |
|---|--------------|
| <b>Q.1 (a)</b> Define the following terms.  | <b>03</b>    |
| 1. Acceptable Quality Level (AQL)   |              |
| 2. Rejectable Quality Level (RQL)   |              |
| 3. Average Outgoing Quality (AOQ)   |              |
| <b>(b)</b> What type of layout is used in Shipbuilding? Justify your answer.                | <b>04</b>    |
| <b>(c)</b> Differentiate between Process layout and Product layout.                         | <b>07</b>    |
| <b>Q.2 (a)</b> Enlist the factors influencing plant layout.                                 | <b>03</b>    |
| <b>(b)</b> List any eight objectives of Production Planning and Control.                    | <b>04</b>    |
| <b>(c)</b> Explain operating characteristics curves for the acceptance sampling.            | <b>07</b>    |
| <b>OR</b>   |              |
| <b>(c)</b> The following table shows the number of defects observed in 25 similar castings. | <b>07</b>    |

Casting No.	No. of Defects	Casting No.	No. of Defects	Casting No.	No. of Defects
1	7	11	22	21	9
2	14	12	15	22	11
3	14	13	8	23	7
4	18	14	24	24	26
5	8	15	14	25	8
6	14	16	9		
7	8	17	9		
8	11	18	11		
9	20	19	10		
10	12	20	8		

1. Find  $\bar{C}$ .
2. Compute trial control limits.

- |  |           |
|--|-----------|
| <b>Q.3 (a)</b> Define the following terms.   | <b>03</b> |
| 1. Cycle time  |           |
| 2. Balance Delay   |           |
| 3. Line efficiency   |           |
| <b>(b)</b> For the following given data, calculate the forecast for the 11 <sup>th</sup> month using 1) two months average; 2) Three months average. | <b>04</b> |

Month	1	2	3	4	5	6	7	8	9	10
Actual sale	10	12	8	11	9	10	15	14	16	15

- (c) Give a detailed explanation of the three phases of PPC. **07**

**OR**

- Q.3** (a) Enlist the six applications of Sales forecasting techniques. **03**

- (b) The following table represents sales data of cars sold by XYZ showroom during the January to December month. Take  $\alpha=0.2$  and for the January month forecast of 100 cars. Calculate the forecast value by the exponential smoothing method. **04**

Month	1	2	3	4	5	6	7	8	9	10	11	12
Actual sale	96	106	92	114	108	98	99	115	106	91	102	99

- (c) What is Line balancing? Discuss the steps involved in line balancing by taking a suitable example. **07**

- Q.4** (a) What is Productivity? Enlist various ways to improve productivity. **03**

- (b) Make a list of the goals and objectives of Industrial Legislation. **04**

- (c) Discuss the Operation Process Chart by considering any appropriate example. **07**

**OR**

- Q.4** (a) Define the following: **03**

1. Productivity
2. Work study
3. Ergonomics

- (b) What is Therbling? State its importance in micro motion study. **04**

- (c) Discuss the String diagram by considering any appropriate example and also state its advantages. **07**

- Q.5** (a) Enlist the various kinds of waste. **03**

- (b) List out obstacles in the way of an Entrepreneur's development. **04**

- (c) Enlist various sampling plans and explain the Double sampling plan with suitable examples. **07**

**OR**

- Q.5** (a) Briefly justify the need for waste management. **03**

- (b) State various government incentives to entrepreneurs. **04**

- (c) Define "Process capability". For the examples listed below, what will be the process's final outcome? **07**

1.  $CP > 1$
2.  $CP < 1$
3.  $CP = 1$

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